Installation and Operation

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Qualified Persons

⚠ WARNING

Only qualified persons knowledgeable in the installation, operation, and maintenance of overhead and underground electric distribution equipment, along with all associated hazards, may install, operate, and maintain the equipment covered by this publication. A qualified person is someone trained and competent in:

- The skills and techniques necessary to distinguish exposed live parts from nonlive parts of electrical equipment
- The skills and techniques necessary to determine the proper approach distances corresponding to the voltages to which the qualified person will be exposed
- The proper use of special precautionary techniques, personal protective equipment, insulated and shielding materials, and insulated tools for working on or near exposed energized parts of electrical equipment

These instructions are intended only for such qualified persons. They are not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment.

Read This Instruction Sheet

NOTICE

Thoroughly and carefully read this instruction sheet and all materials included in the product's instruction handbook before installing or operating the Fault Tamer Fuse Limiter. Become familiar with the "Safety Information" section on page 3 and "Safety Precautions" section on page 4. The latest version of this publication is available online in PDF format at **sandc.com/en/product-literature/**.

Retain This Instruction Sheet

This instruction sheet is a permanent part of the Fault Tamer Fuse Limiter. Designate a location where users can easily retrieve and refer to this publication.

Proper Application

⚠ WARNING

The equipment in this publication is only intended for a specific application. The application must be within the ratings furnished for the equipment. Ratings for the Fault Tamer Fuse Limiter are listed in the ratings table in Specification Bulletin 451-31. The ratings are also on the nameplate affixed to the product.

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels and tags attached to the product. Become familiar with these types of messages and the importance of these signal words:

⚠ DANGER

"DANGER" identifies the most serious and immediate hazards that will likely result in serious personal injury or death if instructions, including recommended precautions, are not followed.

⚠ WARNING

"WARNING" identifies hazards or unsafe practices that can result in serious personal injury or death if instructions, including recommended precautions, are not followed.

⚠ CAUTION

"CAUTION" identifies hazards or unsafe practices that can result in minor personal injury if instructions, including recommended precautions, are not followed.

NOTICE

"NOTICE" identifies important procedures or requirements that can result in product or property damage if instructions are not followed.

Following Safety Instructions

If any portion of this instruction sheet is unclear and assistance is needed, contact the nearest S&C Sales Office or S&C Authorized Distributor, or call the S&C Technical Assistance Center at 1-888-762-1100. Telephone numbers are also listed on S&C's website, **sandc.com**.

NOTICE

Read this instruction sheet thoroughly and carefully before installing the Fault Tamer Fuse Limiter.



Replacement Instructions and Labels

If additional copies of this instruction sheet are required, contact the nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

It is important that any missing, damaged, or faded labels on the equipment be replaced immediately. Replacement labels are available by contacting the nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

⚠ DANGER



Fault Tamer Fuse Limiters operate at high voltage. Failure to observe the precautions below will result in serious personal injury or death.

Some of these precautions may differ from your company's operating procedures and rules. Where a discrepancy exists, follow your company's operating procedures and rules.

1. **QUALIFIED PERSONS.** Access to the Fault Tamer Fuse Limiter must be restricted only to qualified persons. See the "Qualified Persons" section on page 2.
2. **SAFETY PROCEDURES.** Always follow safe operating procedures and rules.
3. **PERSONAL PROTECTIVE EQUIPMENT.** Always use suitable protective equipment, such as rubber gloves, rubber mats, hard hats, safety glasses, and flash clothing, in accordance with safe operating procedures and rules.
4. **SAFETY LABELS.** Do not remove or obscure any of the "DANGER," "WARNING," "CAUTION," or "NOTICE" labels. Remove tags ONLY if instructed to do so.
5. **ENERGIZED COMPONENTS.** Always consider all parts live until de-energized, tested, and grounded.
6. **MAINTAINING PROPER CLEARANCE.** Always maintain proper clearance from energized components.
7. **OPERATION.** Do not attempt to open a Fault Tamer Fuse Limiter to interrupt load current without the use of a loadbreak tool such as Loadbuster®—The S&C Loadbreak Tool. Fault Tamer Fuse Limiters are designed to protect equipment and to disconnect faulted equipment from the system. Fault Tamer Fuse Limiters cannot protect personnel from injury or electrocution if contact is made with energized circuits or hardware.

Inspection

Examine the shipment for external evidence of damage as soon after receipt as possible, preferably before removal from the carrier's conveyance. Check the bill of lading to make sure the listed shipping skids, crates, and containers are present:

If there is visible loss and/or damage:

STEP 1. Notify the delivering carrier immediately.

STEP 2. Ask for a carrier inspection.

STEP 3. Note condition of shipment on all copies of the delivery receipt.

STEP 4. File a claim with the carrier.

If concealed damage is discovered:

STEP 1. Notify the delivering carrier within 15 days of receipt of shipment.

STEP 2. Ask for a carrier inspection.

STEP 3. File a claim with the carrier.

Also, notify S&C Electric Company in all instances of loss and/or damage.

Handling

⚠ WARNING

To better protect against damage during handling, do not remove the Fault Tamer Fuse Limiter from the original packaging until ready to install in service. **Energizing damaged units can cause personal injury, fire, or equipment or property damage.**

Installing the Fault Tamer Fuse Limiter Mounting

Complete the following steps to install the mounting for the Fault Tamer Fuse Limiter.

STEP 1. Attach the Fault Tamer Fuse Limiter mounting to a suitable mounting bracket, as illustrated in Figure 1.

Note: A mounting bracket suitable for crossarm, pole, or wall mounting is furnished only if it has been specified through the addition of suffix "-B" or "-C" to the catalog number of the Fault Tamer Fuse Limiter.

Tighten the carriage bolt nut until snug but still loose enough to permit pivot adjustment. Note the placement of the external-tooth lockwasher between the Fault Tamer Fuse Limiter center insert and the mounting bracket.

STEP 2. Pivot the Fault Tamer Fuse Limiter mounting to a position that will provide maximum ease of operation and then securely tighten the carriage bolt nut.

STEP 3. Make electrical connections. When using aluminum conductors, be sure to wire-brush them and apply a coating of oxidation inhibitor before inserting them into the mounting's connectors. Tighten the connector hardware.

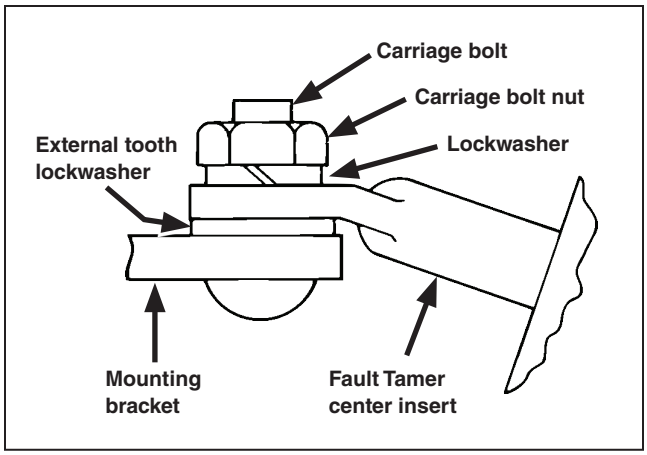


Figure 1. Detail of attachment of the Fault Tamer Fuse Limiter mounting to the mounting bracket.

Complete the following steps to assemble a new Fault Tamer Fuse Limiter:

STEP 1. Carefully unbox the Fault Tamer Fuse Limiter components. Before installing the fuse cartridge into the fuse tube assembly, visually inspect the contact clip on the fuse tube assembly. See Figure 2. The contact clip should be present and undamaged as shown in Detail (A). If the contact clip is missing as shown in Detail (B) or damaged, do not install the Fault Tamer Fuse Limiter.

⚠ WARNING

Check for a damaged or missing contact clip before energizing a Fault Tamer Fuse Limiter. Placing a Fault Tamer Fuse Limiter into service with a damaged or missing contact clip can **cause personal injury, fire, or equipment or property damage.**

STEP 2. Unscrew the fuse-tube cap from the fuse tube and remove the spring-and-cable assembly. See Figure 3 on page 8.

STEP 3. Screw a new fuse cartridge into the lower end of the spring-and-cable assembly. Hand-tighten until the thread bottoms out.

STEP 4. Pull through the red-beaded plastic pull tab until the large bead at the end of the pull tab engages with the end of the cartridge, as shown in Figure 3 on page 8, and insert the entire assembly (fuse cartridge and spring-and-cable assembly) into the fuse tube. Then, screw the fuse-tube cap on the fuse-tube upper ferrule and tighten securely with pliers.

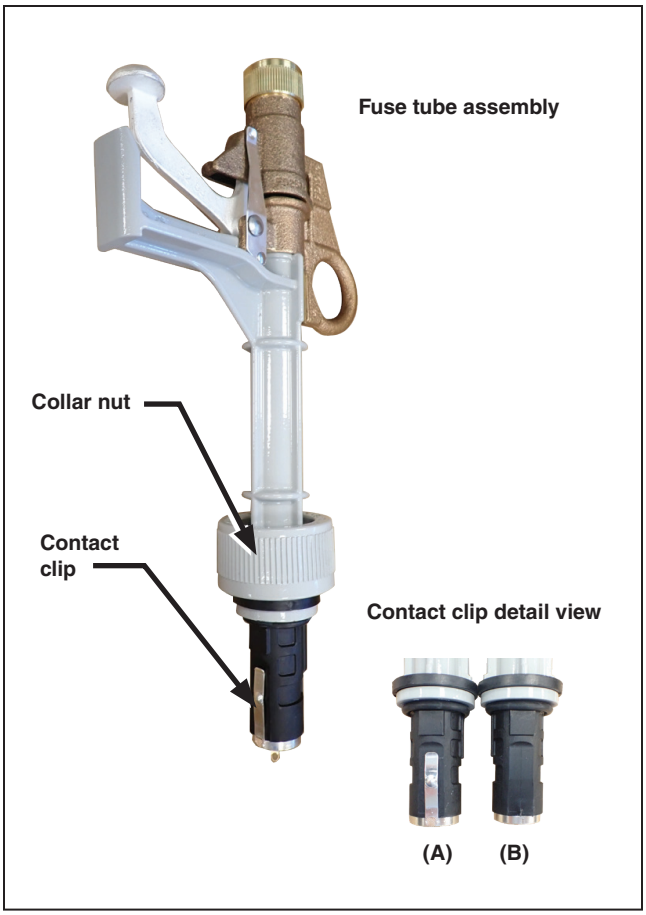


Figure 2. Inspect the contact clip on the bottom of the fuse tube.

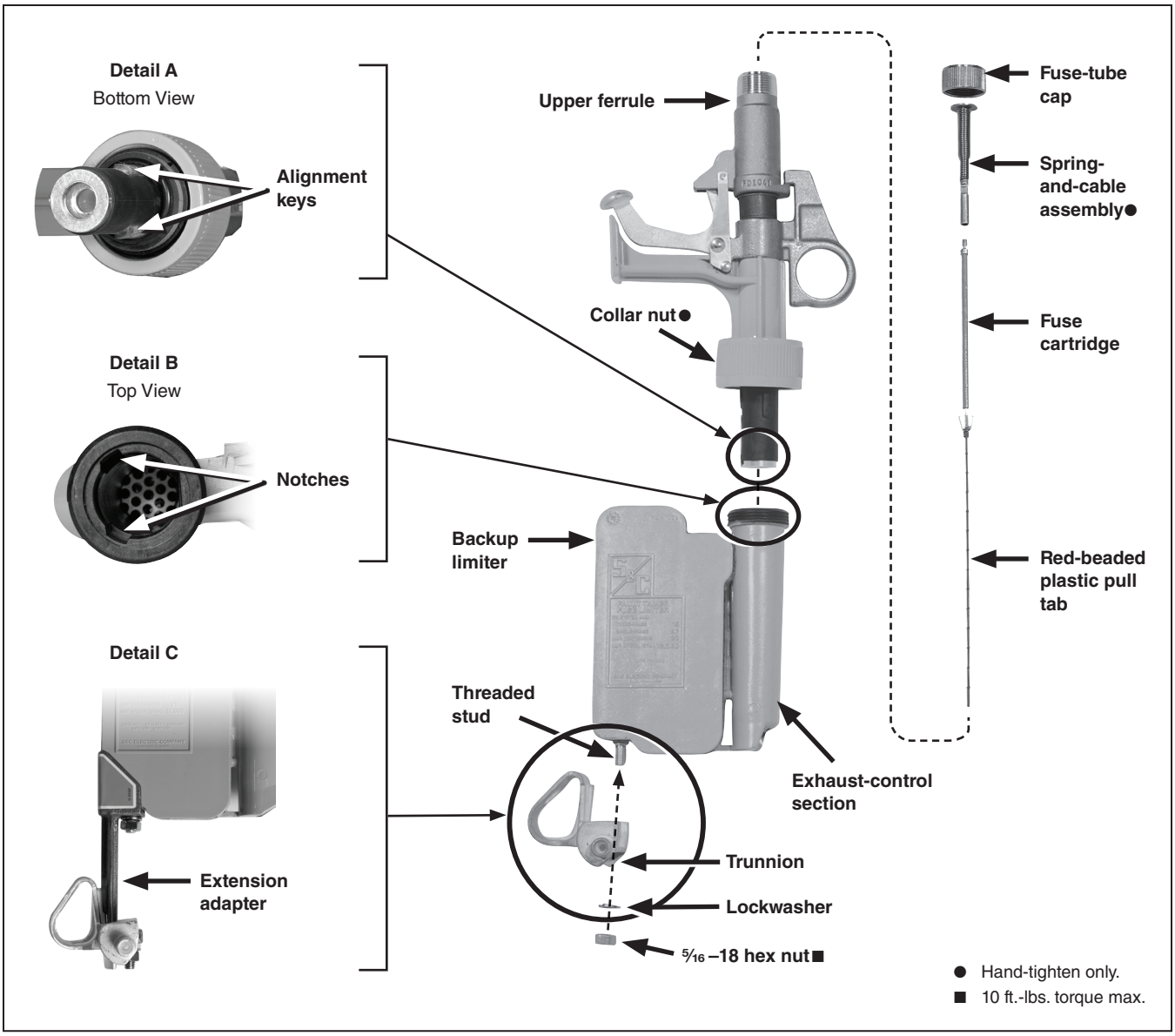


Figure 3. Fault Tamer backup limiter, fuse tube, and fuse cartridge.

STEP 5. Carefully pull on the red-beaded plastic pull tab to pull the fuse cartridge through the fuse tube, against spring tension, until the contact fingers expand into the ring contact on the fuse tube. See Figure 4 (top illustration).

Avoid jerking and excessive overtravel. Slowly release the red-beaded plastic pull tab, permitting the contact fingers to rest on the ring contact. See Figure 4 (bottom illustration). Remove the red-beaded plastic pull tab as shown in Figure 5. Discard the plastic pull tab after removal.

NOTICE

Do not break off red-beaded plastic pull tab. The contact fingers may separate from the ring contact, allowing the fuse cartridge to pull back into the fuse tube and requiring the fuse cartridge to be installed again. The proper way to remove the red-beaded plastic pull tab is shown in Figure 5.

STEP 6. Immediately prior to installation, check the limiter to ensure no damage occurred during shipping. Visually inspect the unit with the trunnion removed to make sure there are no cracks or other visible damage.

⚠ WARNING

Check the backup limiter for damage during shipping. Failure to check the backup limiter for shipping damage can result in a damaged backup limiter being placed into service, which **can cause personal injury, fire, or equipment or property damage.**

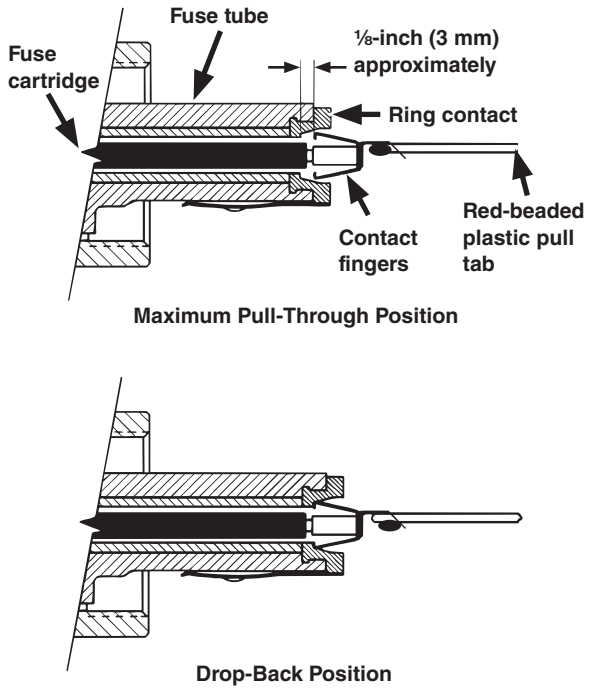


Figure 4. Installation of Fault Tamer Fuse Limiter cartridge.



Figure 5. The proper way to remove the red-beaded plastic pull tab.

STEP 7. Align the keys on the fuse tube with the notches in the exhaust-control section of the backup limiter. See Figure 3 on page 8, Details A and B. Insert the fuse tube into the exhaust-control section and hand-tighten the collar nut.

⚠ WARNING

The alignment keys in the fuse tube and the notches in the exhaust control section of the backup limiter are intended to guard against inadvertent use of fuse tubes applicable to one system voltage with backup limiters applicable to a different system voltage. Do not defeat the alignment keys or notches or force together a fuse tube with a backup limiter it is not designed to work with. **Misapplying Fault Tamer Fuse Limiter components can result in arcing, fire, equipment damage, serious injury, or death.**

STEP 8. Attach the trunnion to the threaded stud on the backup limiter with the lockwasher and 5/16–18-inch hex nut provided. See Figure 3 on page 8.

For over-insulated Fault Tamer Fuse Limiters with extension adapter: Remove the trunnion from the backup limiter, if installed. Save the hardware. Attach the extension adapter to the threaded stud on the backup limiter with the lockwasher and 5/16–18 hex nut provided. Then, attach the trunnion to the extension adapter with the 5/16–18 × 7/8-inch hex-head cap screw, lockwasher, and 5/16–18-inch hex nut provided. See Figure 3 on page 8 Detail C.

NOTICE

Do not overtighten 5/16–18-inch hex nut (10 ft.-lbs max.). Damage to the backup limiter may result if the hex nut is overtightened.

STEP 9. Immediately prior to installation, check the electrical continuity between the trunnion and the upper contact to ensure to ensure electrical integrity of the current path of the Fault Tamer Fuse Limiter. Touch one lead of the continuity tester to the trunnion and the other to the upper contact button. See Figure 6.

⚠ WARNING

Failure to check the Fault Tamer Fuse Limiter for continuity can return a limiter to service that has already operated. **This can result in personal injury, fire, equipment, or property damage.**

The Fault Tamer Fuse Limiter is now ready for installation.

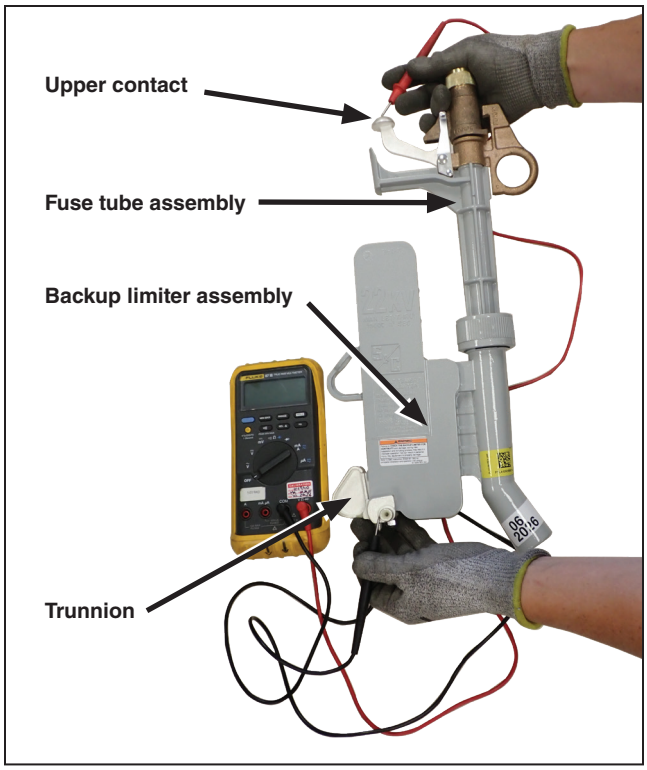


Figure 6. Check the electrical continuity between the trunnion and the upper contact.

Before installing a Fault Tamer Fuse Limiter into a mounting, complete the assembly steps in the "Fusing" section starting on page 7. Then, complete the following steps to install and close a Fault Tamer Fuse Limiter into a mounting:

STEP 1. Insert the curled prong of a Talon™ Handling Tool or a distribution prong into the opening of the lifting eye. See Figure 7. As an alternative, insert the straight prong on the Talon tool or a distribution prong into the keyhole opening in the trunnion. For some Fault Tamer Fuse Limiters, the lifting eye is located in the trunnion. For other models, the lifting eye is molded into the backup limiter.

STEP 2. Guide the Fault Tamer Fuse Limiter into the hinge of the mounting, as shown in Figure 7. Then, disengage the distribution prong. If a Talon tool is used, rotate the universal pole counterclockwise 180° to disengage.

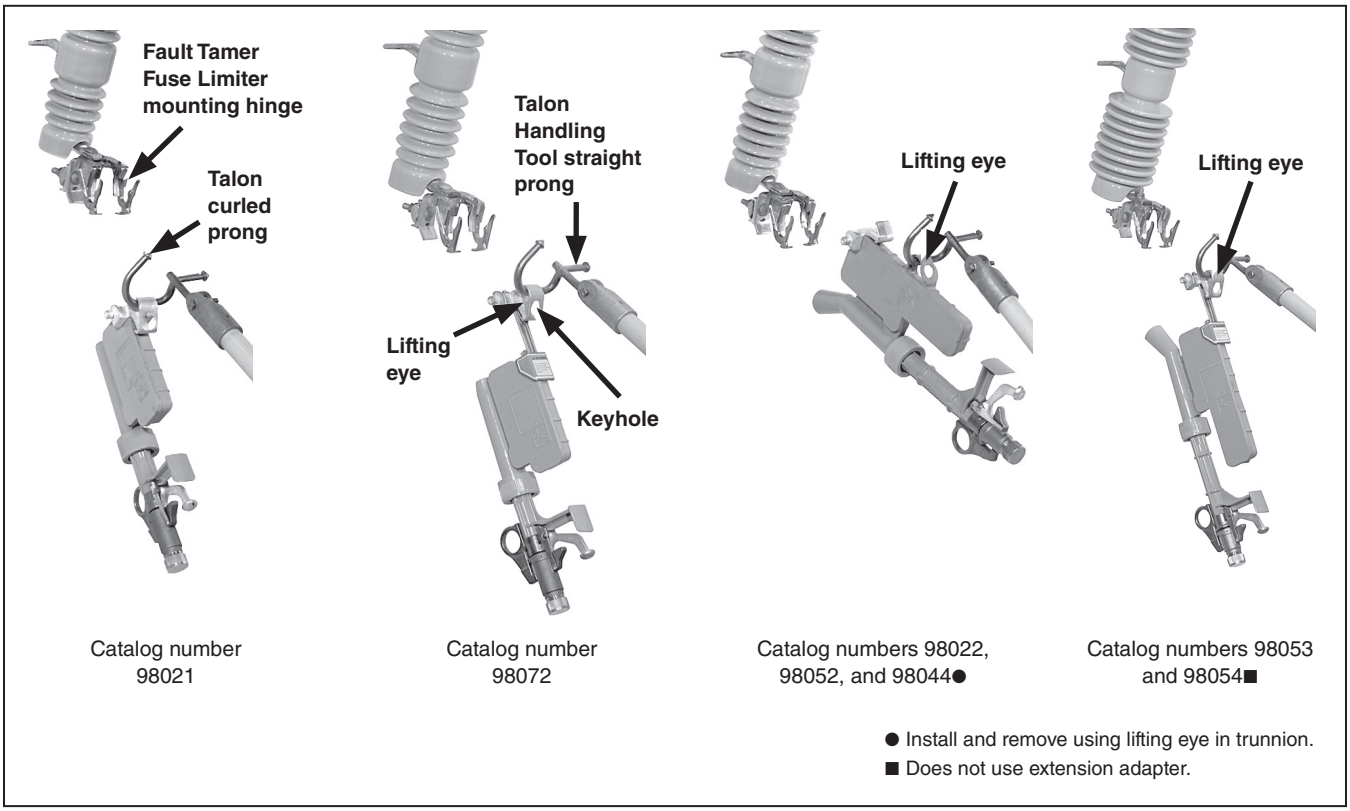


Figure 7. Installing a Fault Tamer Fuse Limiter into a mounting.

STEP 3. Close the fuse into the mounting. Refer to Figure 8.

(a) Stand firmly in front of and in line with the cutout mounting. Do not operate directly underneath the Fault Tamer Fuse Limiter. Insert the straight prong of the Talon Handling Tool or a distribution prong into the pull-ring on the fuse tube.

To close the Fault Tamer Fuse Limiter using an extendostick: Stand between 12 to 15 feet (3.7 to 4.6 m) away from the pole.

(b) Swing the Fault Tamer Fuse Limiter to within approximately 45° of the fully **Closed** position. See Figure 8. Then, while looking away from the Fault Tamer Fuse Limiter, drive the Fault Tamer Fuse Limiter into the **Closed** position using a vigorous forward thrust.

(c) Disengage the prong from the pull-ring, making sure to avoid pulling open the Fault Tamer Fuse Limiter.

⚠ WARNING

Do not use the Talon Handling Tool curled prong to close a Fault Tamer Fuse Limiter. **Use of the curled prong to close a Fault Tamer Fuse Limiter can prevent full closure, resulting in arcing, equipment damage, fire, serious injury, or death.**

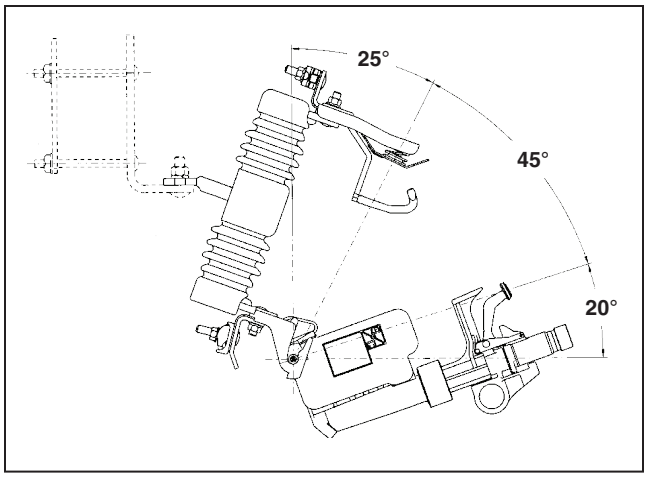


Figure 8. Swing the Fault Tamer Fuse Limiter to within approximately 45° of the fully Closed position (approximately 20° above the horizontal) before a final Closing operation.

Complete the following steps when re-fusing a Fault Tamer Fuse Limiter:

STEP 1. When a Fault Tamer Fuse Limiter operates, it swings to the **Open** position. Remove it from the mounting using a universal pole and a suitable fuse-handling fitting, such as a Talon™ Handling Tool or a distribution prong. See Figure 7 on page 12.

> **⚠ CAUTION**
>
> As with any current-limiting fuse, when a backup limiter operates, it can become hot enough to cause burns. **Wear gloves and handle the Fault Tamer Fuse Limiter by the fuse tube to avoid possible burn injury.**

STEP 2. Unscrew the collar nut and remove the fuse tube from the backup limiter.

STEP 3. Determine whether the backup limiter has operated by checking its continuity. Touch one lead of the continuity tester to the trunnion and the other to the button contact inside the exhaust-control device. See Figure 9. The continuity test must be performed as part of the re-fusing procedure after every Fault Tamer Fuse Limiter operation.

> **⚠ WARNING**
>
> Failure to check the backup limiter for continuity can return a limiter to service that has already operated. **This can result in personal injury, fire, equipment, or property damage.**

If the backup limiter does not have continuity, remove the trunnion so it can be reused, and then discard the backup limiter. If the backup limiter does have continuity, it can be reused—but first, remove any debris that might be inside the exhaust-control section of the backup limiter.

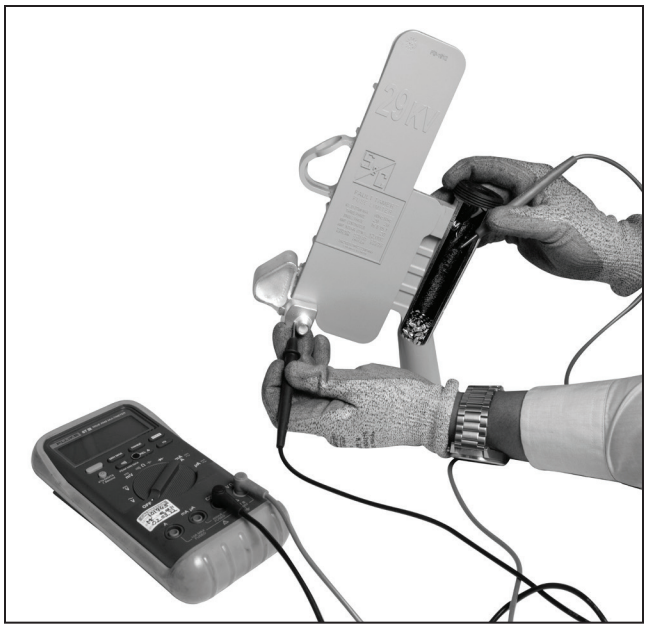


Figure 9. Checking the continuity of a backup limiter.

⚠ WARNING

Failure to remove debris from inside the exhaust-control section can prevent full travel of the fuse cartridge during a subsequent fault-clearing operation. **This can result in arcing, fire, equipment damage, serious injury, or death.**

Do not remove the screen or copper shot at the bottom of the exhaust-control section. See Figure 3 on page 8. **Doing so can result in serious injury or death during a subsequent fault-clearing operation.**

STEP 4. Unscrew the fuse-tube cap from the fuse tube and remove the spring-and-cable assembly. Unscrew the upper terminal of the blown fuse cartridge from the spring-and-cable assembly and discard. If the spring-and-cable assembly is damaged, install a new assembly.

STEP 5. Visually inspect the fuse tube bore and, if required, remove any debris.

STEP 6. Visually inspect the fuse tube for cracks or other visible damage. Fuse tubes with damage should be replaced.

STEP 7. Visually inspect the contact clip on the fuse tube as shown in Figure 10 for damage or erosion. Fuse tubes with contact clip damage or erosion should be replaced.

⚠ WARNING

A Fault Tamer fuse tube with contact clip erosion or damage should not be returned to service. **Doing so can cause personal injury, fire, or equipment or property damage.**

STEP 8. Push the upper ferrule down until it reaches a positive stop to verify full travel of the upper ferrule and the latching mechanism. See Figure 3 on page 8.

Continue with Step 3 through Step 9 of the "Fusing" section starting on page 7.

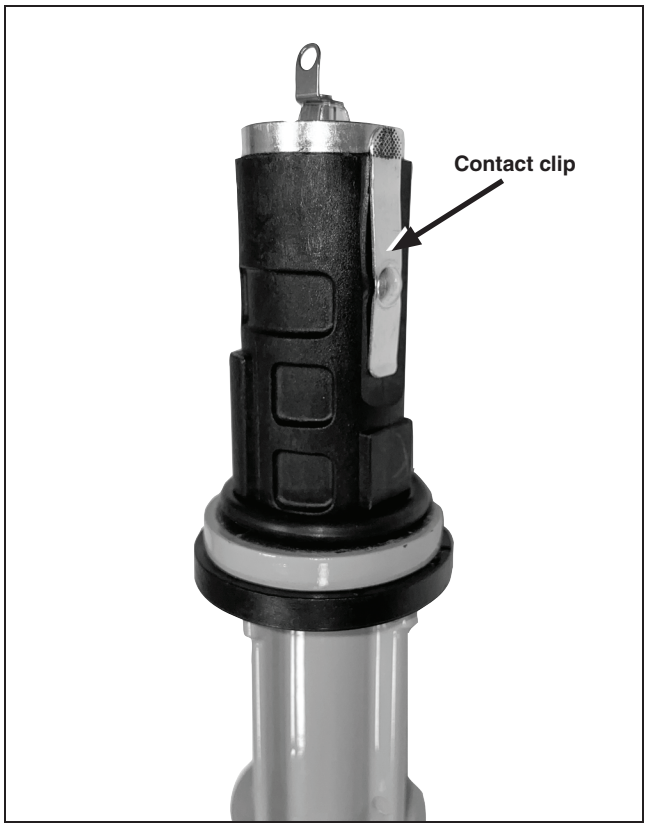


Figure 10. The Fault Tamer fuse tube contact clip.

Opening a Fault Tamer Fuse Limiter

⚠ WARNING

Do not attempt to open a Fault Tamer Fuse Limiter to interrupt load current without the use of a loadbreak tool such as Loadbuster®—The S&C Loadbreak Tool. **Doing so can cause arcing, fire, equipment damage, serious injury, or death.**

The Loadbuster tool is ideally suited for use in opening Fault Tamer Fuse Limiters. The Loadbuster tool is S&C's unique method of providing low-cost, positive, and convenient live-switching capability for such devices. Instructions for use of the Loadbuster tool with a Fault Tamer Fuse Limiter are shown in the next section.

Following an opening operation using a Loadbuster tool, the Fault Tamer Fuse Limiter can be lifted out of the mounting using a universal pole equipped with a suitable fuse-handling fitting, such as a Talon Handling Tool or a distribution prong.

⚠ WARNING

A Fault Tamer Fuse Limiter should not be left in the **Open** position for an extended period of time because water may damage the fuse tube. **Energizing damaged units can cause personal injury, fire, or equipment or property damage.**

Opening with Loadbuster®— The S&C Loadbreak Tool

Complete the following steps to open a Fault Tamer Fuse Limiter with a Loadbuster tool:

STEP 1. Check for proper resetting of the Loadbuster tool by extending the tool about 3 inches (76 mm) by hand. Throughout this travel, an increasing spring resistance should be felt.

STEP 2. Reach the Loadbuster tool across in front of the Fault Tamer Fuse Limiter and hook the anchor, located at the top of Loadbuster tool, over the attachment hook on the far side of the Fault Tamer Fuse Limiter. See Figure 11.

STEP 3. Swing the Loadbuster tool toward the Fault Tamer Fuse Limiter and pass the Loadbuster tool's pull-ring hook through the pull-ring on the Fault Tamer Fuse Limiter. The pull-ring latch will deflect and upon complete entry of the pull-ring will spring back, locking the Loadbuster tool to the pull-ring. The Loadbuster tool is now connected across the upper contacts of the Fault Tamer Fuse Limiter.

STEP 4. ***To open the circuit:*** Operate the Loadbuster tool with a firm, steady pull until it is extended to its maximum length. See Figure 12. Avoid jerking and hesitation. The resetting latch will keep it open. Generally, there will be no indication of circuit interruption. The only sound will be that of the Loadbuster tool tripping.

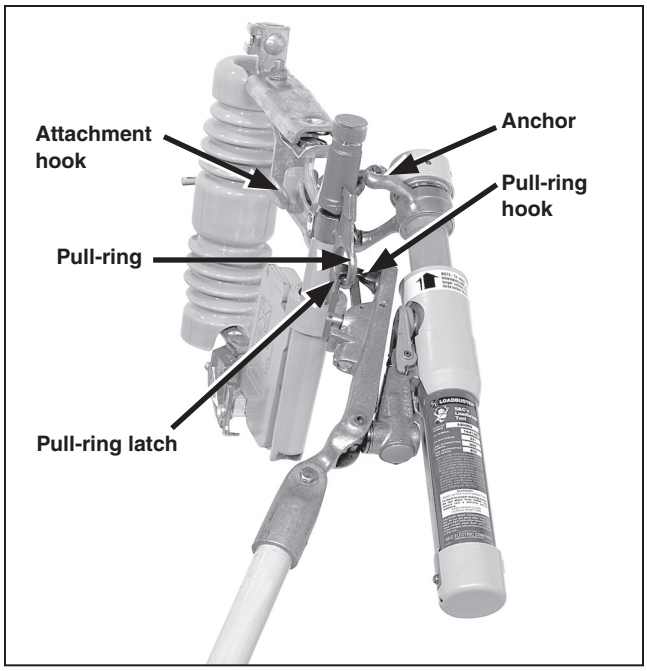


Figure 11. A Loadbuster tool connected to a Fault Tamer Fuse Limiter.



Figure 12. A Loadbuster tool in the Tripped position.

STEP 5. ***To detach a Loadbuster tool after circuit interruption:*** First raise it slightly and disengage the anchor from the attachment hook.

> **⚠ WARNING**
>
> Improper handling of the Loadbuster tool can decrease the open gap to the point where flashover will occur. **This can result in arcing, fire, serious injury, or death.**

Next, bring the Fault Tamer Fuse Limiter toward its fully **Open** position, as illustrated in Figure 13. Then, remove the Loadbuster tool from the pull-ring by rotating the pole. This will deflect the pull-ring latch to release the pull-ring.

Because a Fault Tamer Fuse Limiter will drop fully open by gravity, it may be preferred to remove the Loadbuster tool by "rolling" it off both the attachment hook and pull-ring at the same time by twisting the pole after the Loadbuster tool has been tripped and fully extended. To perform this operation easily and smoothly, always roll the Loadbuster tool so it rotates in an upward direction.

STEP 6. To reset a Loadbuster tool for the next operation, hold it as shown in Figure 14. Extend the tool slightly and lift the resetting latch with a thumb.

With the latch up, telescope the tool completely so the trigger can reset itself. Depress the telescoping tube until the orange paint on the inner tube assembly is no longer visible. Check for proper resetting by extending the tool about 3 inches (76 mm). Throughout this travel an increasing spring resistance should be felt.

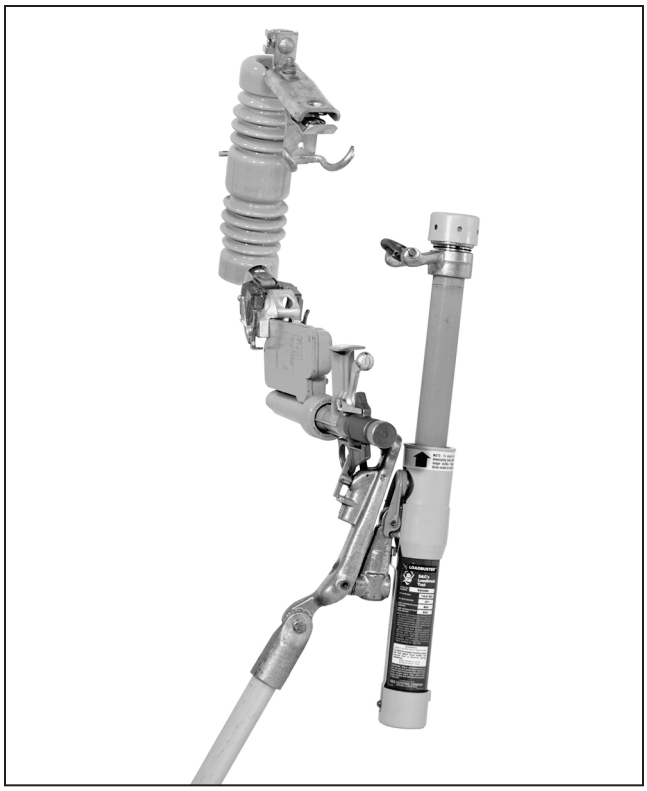


Figure 13. Detaching a Loadbuster tool from a Fault Tamer Fuse Limiter.

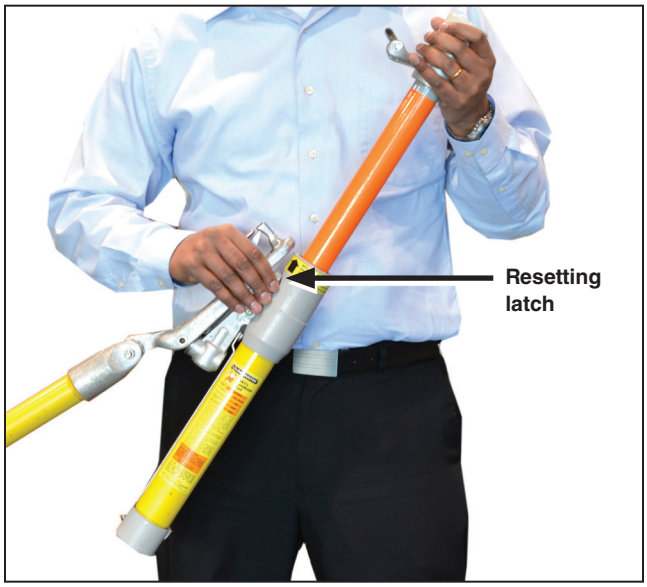


Figure 14. Resetting the Loadbuster tool.

S&C recommends routine inspection of Fault Tamer Fuse Limiter installations to check for any corrosion on metal components, any cracks or deterioration of the plastic housing, or any missing components.

If there is any evidence of corrosion on metal components, evident cracks or deterioration of the plastic housing, or if components are missing, the installation should be replaced with new Fault Tamer Fuse Limiter components as soon as possible.

The schedule for inspecting Fault Tamer Fuse Limiter installations is dependent on environmental conditions and the installation location. S&C recommends the inspection schedule be based on standard utility practice for outdoor distribution equipment.